

THE THELEPHORACEAE OF NORTH AMERICA. XIII¹

CLADODERRIS, HYPOLYSSUS, CYMATELLA, SKEPPERIA, CYTIDIA,
SOLENTIA, MATRUCHOTIA, MICROSTROMA, PROTOCORO-
NOSPORA, AND ASTEROSTROMA

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CLADODERRIS

Cladoderris Persoon in Gaudichaud, Voy. Urania Bot. 176. *pl.*
1, f. 4. 1826; Berkeley, Hooker's London Jour. Bot. 1: 152. 1842;
Léveillé, Ann. Sci. Nat. Bot. III. 2: 213. 1844; Fries, Fungi
Natal. 20, in K. Sv. Vet. Akad. Handl. 1848; Sacc. Syll. Fung. 6:
547. 1888; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 126. 1898;
Lloyd, Myc. Writ. 4: Syn. *Cladoderris* 2. 1913.—*Cymatoderma*
Junghuhn, Fl. Crypt. Javae. 1838. Translation of description
of the new genera and species by Montagne, Ann. Sci. Nat. Bot.
II. 16: 320. 1841, *Cymatoderma* being designated as a synonym
of *Cladoderris*.—*Actinostroma* Klotzsch, Nova Acta Acad. Leop.-
Carol. 19: 236. 1843.—*Beccariella* Cesati, Atti Accad. Sci. Napoli
8³: 9. 1879.

Fructification coriaceous, pileate, stipitate or sessile; hymenium
inferior, with radiating or branched folds, ribs, or veins, verrucose
also in some species; basidia simple; spores white, even.

The type species is *Cladoderris dendritica*.

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(1)

The species of *Cladoderris* have the same internal structure as those of *Stereum*, and the genus is distinguished from the latter merely by the conspicuously ribbed configuration of the hymenial surface. The genus is tropical in its geographical distribution, although one species has been described from England and another from Florida; the fructifications grow on rotten wood. The earlier gatherings, consisting of only one or two fructifications at a time taken by explorers, sometimes had the stem central in the specimens saved, at other times lateral, and at others, sessile. Each such gathering was made the basis for a new species and the species were arranged in the genus in central-stemmed, lateral-stemmed, or sessile sections. Field observations and more ample collections by mycologists have reduced many such species to synonyms and show that the above sections are of little value; for in *Cladoderris*, as in the other *Thelephoraceae* growing on logs, the inclination of the substratum at the point of attachment and the position of the substratum as to whether over or under the fructification are important in determining the habit and form of the fructification, as already pointed out for *Stereum* and *Hymenochaete* (Mo. Bot. Gard. Ann. 5: 302. 1918).

KEY TO THE SPECIES

Hymenium not at all or but slightly verrucose.....1. *C. dendritica*
 Hymenium abundantly verrucose.....2. *C. floridana*

1. *Cladoderris dendritica* Persoon in Gaudichaud, Voy. Urania Bot. 176. pl. 1, f. 4. 1826 (under *Cladoderris* of *Thelephora*); Léveillé, Ann. Sci. Nat. Bot. III. 2: 213. 1844; Fries, Fungi Natal. 22, in K. Sv. Vet. Akad. Handl. 1848; Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 549. 1888; Lloyd, Myc. Writ. 4: Syn. *Cladoderris* 3. text f. 520-523. 1913. Plate 1, fig. 1.

Actinostroma crassum Klotzsch, Nova Acta Acad. Leop.-Carol. 19: 237. 1843.—*Cladoderris crassa* (Klotzsch) Fries, Fungi Natal. 22, in K. Sv. Vet. Akad. Handl. 1848; Sacc. Syll. Fung. 6: 549. 1888.—*C. Candolleana* Léveillé, Ann. Sci. Nat. Bot. III. 5: 153. 1846; Sacc. Syll. Fung. 6: 549. 1888; Lloyd, Myc. Writ. 4: Syn. *Cladoderris* 10. 1913.

Pileus coriaceous, usually flabelliform, drying pinkish buff, sometimes stained with adhering algae, stipitate or sessile, the upper surface spongy by the heavy coat of tomentum, the margin entire or nearly so; hymenium glabrous, marked with radiating, narrow, branched ribs, usually free from or with few warts; pileus in structure consisting of an intermediate layer, up to 150 μ thick, composed of densely longitudinally arranged hyaline hyphae about 3 μ in diameter, of a very much broader layer forming the tomentum of the upper surface of the pileus, and of a hymenial layer containing numerous, flexuous, fusoid gloeocystidia up to 60 \times 8–12 μ ; basidia simple, with 4 sterigmata; spores hyaline, even, 3–4 \times 3 μ ; no cystidia found; stem spongy-tomentose but often absent.

Pileus about 2–8 cm. in diameter.

On rotten wood. Mexico, West Indies, South America, Philippine Islands, Australia, and the East Indies. The usual species.

Cladoderris infundibuliformis of the Philippines and the East Indies differs from *C. dendritica* in having the upper side much less tomentose, hazel or kaiser-brown in color, radially ridged and with the ridges radially squamulose, and the hymenium containing some incrustated cystidia.

Specimens examined:

Mexico: Orizaba, *W. A. & E. L. Merrill*, 775 (in N. Y. Bot. Gard. Herb., 775, and Mo. Bot. Gard. Herb., 54611).

Cuba: *C. Wright*, 279 (in Curtis Herb.); Alto Cedro, *Earle & Merrill*, 443, comm. by N. Y. Bot. Gard. Herb.; Baracoa, *L. M. Underwood & F. S. Earle*, 1217, comm. by N. Y. Bot. Gard. Herb., 1139 (in N. Y. Bot. Gard. Herb.); Fecha, Habana, *Cooke & Horne*, comm. by Estacion Central Agronomica, 137; Oriente, *J. A. Shafer*, 3748 (in Mo. Bot. Gard. Herb., 62171, and N. Y. Bot. Gard. Herb.); Pinar del Rio Province, *Earle & Merrill*, 225, comm. by N. Y. Bot. Gard. Herb.

Porto Rico: on dead cane, Rio Piedras, *J. R. Johnston & J. A. Stevenson*, 1110 (in Mo. Bot. Gard. Herb., 55091).

Jamaica: ———, 331 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 62172); Castleton Gardens, *W. Harris*, 128, comm. by N. Y. Bot. Gard. Herb. under the herbarium name *Stereum Harrisii* Mass.; Moore Town, *W. A. & E. L. Merrill*, 136, comm. by N. Y. Bot. Gard. Herb.

Colombia, S. Am.: Cauca River, *W. D. Denton*, comm. by *W. G. Farlow*.

Philippine Islands: Todaya, Mindanao, *A. D. E. Elmer*, 10747 (in *Mo. Bot. Gard. Herb.*, 705748).

2. *C. floridana* Lloyd, *Myc. Writ.* 4. Letter 47: 15. 1913; *Myc. Writ.* 4. *Myc. Notes* 39: 535. *text f.* 734. 1915.

Plate 1, fig. 2.

Type: in Lloyd Herb. and in *Mo. Bot. Gard. Herb.*

Pileus coriaceous, cup-shaped, flabelliform or orbicular, drying tawny olive, spongy tomentose but with the tomentum thinning out towards the margin and the surface there zonate, short-stipitate or sessile, the margin thin, entire; hymenium wood-brown, paler towards the margin, densely, minutely warted, with very numerous, short, radially elongated ridges not continuous in a branched system; pileus in structure consisting of an intermediate layer, about 800 μ broad, composed of interwoven, longitudinally arranged, hyaline hyphae $2\frac{1}{2}$ - $4\frac{1}{2}$ μ in diameter, of a broad layer of the tomentum of the upper surface of the pileus, and of a hymenial layer containing numerous flexuous gloeocystidia up to $60 \times 4\frac{1}{2}$ -6 μ ; spores hyaline, even, 3×2 μ ; hymenial warts up to 80 μ high, 100-200 μ in diameter at the base, composed of a mass of erect, granule-incrusted hyphae; no cystidia found.

Pileus up to 5 cm. in diameter.

On frondose wood. Florida.

The hymenial warts are conspicuous in sections, even though not appreciably elevated above the hymenial surface, by contents of localized masses of granule-incrusted hyphae. This incrusting matter is of different nature from that usually present in the walls of hyphae, because it dissolves completely when the sections are treated with dilute potassium hydrate solution; lactic acid does not destroy the incrusting matter.

Specimens examined:

Florida: Bayard, type, comm. by C. G. Lloyd (in *Mo. Bot. Gard. Herb.*, 56609).

HYPOLYSSUS

Hypolyssus Persoon, *Myc. Eur.* 2: 6. 1825, emend. Berkeley, *Hooker's London Jour. Bot.* 1: 139. *pl. 6, f. 1.* 1842; *Sacc. Syll.*

Fung. 6: 521. 1888; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 127. 1898.

Fructification urn-shaped or top-shaped, hard, corky; hymenium even, lateral.

In adopting the name *Hypolyssus* and defining it anew, Berkeley stated, *loc. cit.*, "As Persoon's genus *Hypolyssus* is altogether effete, and its characters are very like those of the plant before us, I have thought it advisable to restore it."

This genus differs from *Craterellus* by not having the fructifications at all fleshy and by their becoming hard when dry.

1. *Hypolyssus Montagnei* Berkeley, Hooker's London Jour. Bot. 1: 139. *pl. 6, f. 1.* 1842; Sacc. Syll. Fung. 6: 521. 1888; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 127. *text f. 70 E.* 1898. Plate 1, fig. 4.

An *Hypolyssus foetidus* Masee, Jour. Bot. 30: 197. *pl. 325, f. 3-5.* 1892; Sacc. Syll. Fung. 11: 115. 1895?

Type: in Kew Herb. probably.

Fructifications gregarious, dirty white, 1-2 cm. high, hard when dry, solid, turbinate or urn-shaped, the apex sterile, convex at first, at length slightly depressed; stem slender, central, curved, shorter than the pileus when mature; hymenium covering the outside of the fructification with the exception of the apex, even or nearly so; spores hyaline, even, 3-4 μ in diameter, none seen attached to basidia.

Fructifications 1-2 cm. high, 2-7 mm. in diameter.

On rotten wood. Mexico, Central America, Guadeloupe, and South America to Bolivia. February in Mexico, July in Bolivia.

The fructifications are hard when dry but soften when moistened so that they may be readily sectioned; *Craterellus taxophilus* is of somewhat similar form but more fleshy consistency. In all the specimens cited below the hymenium is too deteriorated to show the basidia in my preparations. *H. foetidus* occurs on the island of St. Vincent in the region of *H. Montagnei* and was distinguished from the latter by Masee by fetid odor and rugulose hymenium, but there is no observation on record yet as to absence of odor for *H. Montagnei*. Mycological explorers rarely note such data.

Specimens examined:

Mexico: near Sanborn, Oaxaca, *C. R. Orcutt*, 3336 (in N. Y. Bot. Gard. Herb. and Mo. Bot. Gard. Herb., 37345).

Honduras: *P. Wilson*, 237, comm. by N. Y. Bot. Gard. Herb.

Guiana: *Spruce*, 70 (in Curtis Herb.).

Bolivia: Mapiri, *A. M. Bang*, distributed by Columbia College Herb., 1479 (in Burt Herb., and Mo. Bot. Gard. Herb., 5002).

CYMATELLA

Cymatella Patouillard, Soc. Myc. Fr. Bul. 15: 193. pl. 9, f. 4-6. 1899; Sacc. Syll. Fung. 16: 49. 1902.

Marasmioid fungi, minute, stipitate, reviving with moisture; pileus lacking a pellicle; hymenium inferior, lacking lamellae, even or slightly wavy; spores hyaline.

Cymatella is a genus of a few species of tropical fungi, segregated from *Craterellus*, with which the specimens agree in the even hymenium and consistency, but related to *Marasmius* in structure of the pileus and the reviving of the specimens with moisture. The specimens are not notably marasmioid in the recent gathering which I have seen and the genus seems unnecessary.

1. *Cymatella minima* Patouillard, Soc. Myc. Fr. Bul. 15: 193. pl. 9, f. 6. 1899; Sacc. Syll. Fung. 16: 49. 1902.

Plate 1, fig. 6.

Pileus plano-convex, reniform, glabrous, pale russet (roux), 3-4 mm. broad, thin, very slightly fleshy, without a pellicle, the margin entire, straight, indented at the base; stem filiform, stuffed, 3 mm. long, glabrous, black, marasmioid, a little larger towards the base, attached to the pileus eccentrically near the indentation; trama composed of loosely arranged, septate, pallid-reddish hyphae 3-5 μ in diameter; hymenium inferior, dark red, even or with few radial, shallow undulations; basidia clavate, 20-23 \times 5-6 μ , with 4 sterigmata; no cystidia; spores hyaline, even, ovoid, 3-4 μ long.

On decaying bark. Guadeloupe.

I have seen no specimens of *C. minima*. The figure, after Patouillard, somewhat resembles *Craterellus Humphreyi*, a much larger species, white in color and fleshy.

2. *C. pulverulenta* (Berk. & Curtis) Patouillard, Soc. Myc. Fr. Bul. 15: 194. pl. 9, f. 4. 1899; Sacc. Syll. Fung. 16: 50. 1902.

Plate 1, fig. 5.

Craterellus pulverulentus Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 520. 1888.

Type: in Kew Herb. and Curtis Herb.

Fructification pallid ferruginous; pileus orbicular, pulverulent, the margin inflexed; stem thickened towards the base, black; hymenium sparingly venose, colored like the pileus.

Pileus 2 mm. broad; stem $2\frac{1}{2}$ mm. long.

On bark of sticks. Cuba and Porto Rico. May and July.

A collection of a dozen or so fructifications from Porto Rico by Professor Stevens, taken in connection with specimens of the type collection in Curtis Herb., shows that while the original description of *C. pulverulenta* by Berkeley & Curtis, literally translated above, is correct as far as it goes it does not give details enough for critical comparison with *C. minima*. The specimens of *C. pulverulenta* are plano-convex rather than campanulate as stated by Patouillard, and the margin only slightly inflexed, entire but slightly notched behind near point of attachment of the stem which is sometimes nearly central but usually distinctly eccentric. The spores are hyaline, even, $3\frac{1}{2} \times 2 \mu$ in the type, $3-6 \times 2-2\frac{1}{2} \mu$ in more copious occurrence in the Porto Rican gathering, and the hyphae slightly colored, $3-4 \mu$ in diameter. The dry specimens in Curtis Herbarium now have the upper surface of the pileus Natal brown of Ridgway and the hymenium and the stem bone-brown.

Specimens examined:

Cuba: *C. Wright*, 564, type (in Curtis Herb.).

Porto Rico: Monte Alegullo, *F. L. Stevens*, 1358 (in Mo. Bot. Gard. Herb., 55402, and Stevens Herb.).

3. *C. marasmioides* (Berk. & Curtis) Patouillard, Soc. Myc. Fr. Bul. 15: 194. pl. 9, f. 5. 1899; Sacc. Syll. Fung. 16: 50. 1902.

Craterellus marasmioides Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 520. 1888.

Type: in Curtis Herb. and Kew Herb. probably.

Pileus eccentric, rugose, glabrous, rufous, the margin inflexed; stem springing from creeping rhizomorphs, thickened below, black; hymenial folds thick, venose; basidia simple; spores hyaline, even, globose, 4 μ in diameter—only one found and this not attached to a basidium; no cystidia.

Pileus 1½–2 mm. in diameter; stem 1–3 mm. long, about 140 μ in diameter.

On dead ferns. Cuba.

The fructifications are solitary or in small clusters of up to 5, branching from a common point on the bark and bone-brown throughout; stem central or eccentric in attachment to the pileus. The note on the label as to substratum is "on stumps."

Specimens examined:

Cuba: *C. Wright*, 32, type (in Curtis Herb.).

SKEPPERIA

Skepperia Berkeley, Linn. Soc. Bot. Trans. 22: 130. *pl.* 25, *f.* A. 1857; Sacc. Syll. Fung. 6: 603. 1888; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 127. *text f.* 70. A–D. 1898.

Stem short, lateral, abruptly passing over and confluent for some distance with the upper side of the pileus; pileus clavate, convolute on each side so as to form a longitudinal groove, fibrous within.

Skepperia convoluta is the type species.

Skepperia is a genus of tropical fungi of which three species have been described; two of these occur in South America and one in the West Indies.

1. *Skepperia spathularia* (Berk. & Curtis) Patouillard, Soc. Myc. Fr. Bul. 15: 194. *pl.* 9, *f.* 3. 1899; Sacc. Syll. Fung. 16: 189. 1902. Plate 1, fig. 3.

Craterellus spathularius Berkeley & Curtis, Linn. Soc. Bot. Jour. 10: 328. 1868; Sacc. Syll. Fung. 6: 603. 1888.

Type: in Curtis Herb. and Kew Herb. probably.

Fructifications minute, stipitate, everywhere pinkish buff in dried condition; pileus oblique, spathulate; stem springing from an orbicular base, becoming glabrous; pileus in structure 40–80 μ thick, composed of a layer of longitudinally arranged hyphae

and the hymenial layer; hymenium inferior, nearly even; no cystidia; basidia simple; spores hyaline, even, $5-7\frac{1}{2} \times 3-4 \mu$.

Dried fructifications about $2\frac{1}{2}$ mm. long; pileus $1-1\frac{1}{2}$ mm. long, 1 mm. broad; stem 1 mm. long, 120μ in diameter.

On dead wood in Cuba and on *Nostoc* coating rocks in Trinidad.

Specimens examined:

Cuba: *C. Wright*, 3, type (in Curtis Herb.).

Trinidad: Maravel Beach, near Port of Spain, *R. Thaxter* (in Farlow Herb.).

CYTIDIA

Cytidia Quelet, Fl. Myc. Fr.—1888; Patouillard, Essai Tax. . . . ; Bourdot & Galzin, Soc. Myc. Fr. Bul. 26: 222. 1910; Rea, Brit. Basid. 697. 1922.—*Lomatia* Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 48: 403. 1889.—*Auriculariopsis* R. Maire, Rech. Cyt. Tax. 102. 1902, and Soc. Myc. Fr. Bul. 18: Suppl. 102. 1902; Sacc. Syll. Fung. 21: 423. 1912.

Fructifications coriaceous-gelatinous, cup-shaped, sessile, scattered or crowded, often confluent; hymenium even at first, becoming more or less wrinkled or veined; basidia simple; spores white.

Cytidia is a genus whose few species have usually been included in *Corticium* but differ from this genus in being resupinate by the middle only, with margins free as in some species of *Stereum*. The configuration of the hymenial surface is decidedly merulioid in our single indigenous species.

KEY TO THE SPECIES

White or nearly so, pubescent or tomentose.....1. *C. flocculenta*
 White villose; hymenium blood-red.....2. *C. salicina*
 Deep olive-buff to drab; hymenium becoming coarsely merulioid ...3. *C. tremellosa*

1. *Cytidia flocculenta* (Fr.) v. Höhn. & Litsch. K. Akad. Wiss. Wien Sitzungsber. 116: 758. 1907; Wiesner Festschr. Wien 61. 1908; Bourdot & Galzin, Soc. Myc. Fr. Bul. 26: 222. 1910; Rea, Brit. Basid. 697. 1922. Plate 1, fig. 7.

Thelephora flocculenta Fries, Elench. Fung. 1: 184. 1828.—*Corticium flocculentum* Fries, Epicr. 559. 1838; Hym. Eur. 647. 1874; Sacc. Syll. Fung. 6: 605. 1888.—*Cyphella ampla* Léveillé, Ann. Sci. Nat. Bot. III. 9: 126. 1848; Fries, Hym. Eur. 662.

1874; Sacc. Syll. Fung. 6: 667. 1888; Patouillard, Tab. Anal. Fung. 1: 113. f. 254. 1884.—*Auriculariopsis ampla* (Lév.) R. Maire, Soc. Myc. Fr. Bul. 18: Suppl. 102. pl. 3, f. 22. 1902; Sacc. Syll. Fung. 21: 423. 1912.—*Stereum pubescens* Burt, Mo. Bot. Gard. Ann. 7: 178. pl. 5. f. 50. 1920.

Fructifications membranaceous, cup-shaped, sessile, white-tomentose, the margin entire, free all around; hymenium veined, fawn-color or bright brown; spores white, even, $6-10 \times 3-4 \mu$.

Fructifications 3-10 mm. in diameter, reflexed 1-3 mm.

On *Salix*. Montana and Wyoming. April and May. Rare.

In Europe, this fungus is more frequent on *Populus*. I described the Montana gathering as *Stereum pubescens* with some misgivings. A more recent collection from Wyoming has finally enabled me to refer this species to *Cytidia flocculenta*, a reference which I have confirmed by specimens kindly communicated to me by Bourdot. Since *C. flocculenta* occurs in the United States on *Salix*, gatherings in the past may have been referred to the common *Cytidia* (*Corticium*) *salicina*, from which it differs in smaller, more heavily tomentose pilei and much shorter spores.

Specimens examined:

France: Allier, H. Bourdot, 4726, and two unnumbered specimens; Aveyron, A. Galzin, 13021, comm. by H. Bourdot, 22632.

Montana: Sheridan, Mrs. L. A. Fitch, in Ellis Collection, 7014, type of *Stereum pubescens* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 56784).

Wyoming: Boulder, F. S. Wolpert, comm. by J. R. Weir, 9742 (in Mo. Bot. Gard. Herb., 56222).

2. *C. salicina* (Fries) Burt, n. comb.

Thelephora salicina Fries, Syst. Myc. 1: 442. 1821.—*Corticium salicinum* Fries, Epicr. 558. 1838; Hym. Eur. 647. 1874; Sacc. Syll. Fung. 6: 605. 1888; Masee, Linn. Soc. Bot. Jour. 27: 118. pl. 6, f. 1. 1890.—*Lomatia salicina* (Fr.) Karsten, Finska Vet.-Soc. Bidrag Natur och Folk 48: 404. 1889; Icones Hym. Fenniae, 6. f. 10. 1885.—An *Cytidia rutilans* (Pers.) Quelet in Rea, Brit. Basid. 698. 1922?

Plate 1, fig. 8.

Type: authentic specimen from Fries in Kew Herb.

Fructifications coriaceous, soft, drying horn-like, rigid, pezizoid when young, becoming expanded, more or less confluent, affixed by the center, the margin free all around and upturned, minutely white-villose; hymenium blood-red, even at first, drying somewhat wrinkled; in structure 400–800 μ thick, composed of parallel, longitudinally arranged and ascending hyphae with narrow lumen and walls gelatinously modified; basidia simple, with 2 or 4 sterigmata; spores hyaline, even, cylindric, curved, $12-15 \times 3\frac{1}{2}-5 \mu$ in American specimens, $16-18 \times 6-8 \mu$ in European specimens as recorded by Karsten also.

Fructifications 1–2 mm. in diameter at first, at length up to 6–12 mm. long by confluence.

On dead limbs of *Salix*. Northern Europe and Canada and northern United States. May to December. Common.

Rea gives *Corticium salicinum* as a synonym of *Cytidia rutilans* (Pers.) Quel., with spores globose, 8 μ in diameter. I do not find a species *rutilans* in the index of Persoon's 'Synopsis Fungorum' for any thelephoraceous genus and have not access to Quelet's 'Fl. Myc. France.' The globose spores point to a different species from *Corticium salicinum* Fries, with an authentic specimen of which, in Kew Herbarium, I compared one of my gatherings. The description of *Thelephora cruenta* Persoon, Syn. Fung., is too vague to take priority for the specific name over *salicinum* of Fries.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 4218; Ellis, N. Am. Fungi, 609; Ell. & Ev., Fungi Col., 1212; Shear, N. Y. Fungi, 54; de Thümen, Myc. Univ., 114.

Sweden: *E. Fries* (in Kew Herb.).

Finland: Mustiala, *P. A. Karsten*, in de Thümen, Myc. Univ., 114.

Austria: Gastein Salisb., *Niessl* (in Mo. Bot. Gard. Herb., 43459); Innsbruck, *V. Litschauer*.

Canada: *J. Macoun*.

Ontario: Byron, *J. Dearness*, in Bartholomew, Fungi Col., 4218; Ottawa, *J. M. Macoun*, 15, comm. by N. Y. State Mus. Herb. (in Mo. Bot. Gard. Herb., 56082); Toronto, *J. H. Faull*, Univ. Toronto Herb., 315 (in Mo. Bot. Gard. Herb., 44882).

- Maine: Cumberland, *J. Blake*, comm. by P. L. Ricker; Piscataquis County, *W. A. Murrill*, 2089 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61421).
- New Hampshire: Shelburne, *W. G. Farlow* (in Mo. Bot. Gard. Herb., 4777, 4836).
- Vermont: Middlebury, *E. A. Burt*, three collections and in Ell. & Ev., Fungi Col., 1212; Shelburne, *C. G. Pringle*, 1044 (in N. Y. State Mus. Herb., and Mo. Bot. Gard. Herb., 55908).
- Massachusetts: Cambridge, *W. G. Farlow* (in Mo. Bot. Gard. Herb., 4386).
- Connecticut: Litchfield, *Miss V. S. White* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61360).
- New York: Albany, *C. H. Peck*, in Ellis, N. Am. Fungi, 609, *H. D. House* (in N. Y. State Mus. Herb., and Mo. Bot. Gard. Herb., 59692); Alcove, *C. L. Shear*, in Shear, N. Y. Fungi, 54; East Galway, *E. A. Burt*; Ithaca, *L. B. Walker*, 3 (in Mo. Bot. Gard. Herb., 6693); Middle Grove, *E. A. Burt*; Van Etten, *W. C. Barbour*, 1299 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61666).
- Pennsylvania: Trexlertown, *W. Herbst*, comm. by C. G. Lloyd, 0053.
- Michigan: Ann Arbor, *E. B. Mains*, comm. by A. H. W. Povah, 888 (in Mo. Bot. Gard. Herb., 58173); East Lansing, *G. H. Hicks* (in Mo. Bot. Gard. Herb., 4850); Marquette County, *W. Trelease* (in Mo. Bot. Gard. Herb., 60659).
- Wisconsin: Palmyra, comm. by Univ. Wis. Herb., 58.
- Colorado: Placer, *C. L. Shear*, 1022; Canyon City, *T. S. Brandegee* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61427).
- Manitoba: Shoal Lake, *I. L. Connors*, comm. by G. R. Bisby (in Mo. Bot. Gard. Herb., 58973).
- Idaho: Priest River, *J. R. Weir*, 95, 357 (in Mo. Bot. Gard. Herb., 9534 and 17037 respectively).
- Washington: Falcon Valley, *W. N. Saksdorf*, 2.

3. *C. tremellosa* Lloyd, Myc. Writ. 4. Myc. Notes 38: 516.
text f. 512, 513. 1912. Plate 1, fig. 9.

Type: in Lloyd Herb. probably.

Fructifications coriaceous, soft, resupinate, at first circular, pezizoid, and with the thickened, paler margin slightly upturned, at length confluent, effused, and with the hymenial surface meruloid by the elevated confluent margins and reticulate veins, drying deep olive-buff to drab; hyphae with walls gelatinously modified, nodose-septate; basidia simple, with 2-4 sterigmata; spores white in spore collection, simple, even, $8-11 \times 5-6 \mu$.

Fructifications at first 1-3 mm. in diameter, finally confluent over areas $3-8 \times 3-5$ cm.

On bark of decaying limbs of frondose species in low woods. Louisiana. November to June.

Although the young fructifications of *C. tremellosa* are decidedly pezizoid in aspect, yet, in the specimens seen by me, these small fructifications are in such close proximity to resupinate confluent masses of the same color that the resemblance to a *Merulius* is the more striking.

Specimens examined:

Louisiana: St. Martinville, A. B. Langlois, 2620, 2670, av, 594 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61681); C. G. Lloyd, 2402 (in N. Y. Bot. Gard. Herb. and Burt Herb.).

SOLENIA

Solenia Persoon, Roemer Neues Mag. Bot. 1: 116. 1794; Syn. Fung. 675. 1801; Myc. Eur. 1: 334. 1822; Hoffman, Deutschl. Fl. 2: pl. 8. 1795; Fries, Syst. Myc. 2: 200. 1823; Hym. Eur. 595. 1874; Sacc. Syll. Fung. 6: 424. 1888; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 129. 1898; Rea, Brit. Basid. 701. 1922.

Fructifications coriaceous or membranaceous, sessile or nearly so, cylindric or turbinate, gregarious, fasciculate, rarely solitary, but not joined together except by confluence, seated on a superficial, felt-like, floccose and sometimes fugacious mycelium; basidia simple; spores white or colored.

The type species is *Solenia candida* Pers.

Solenia is closely related to *Cyphella* but differs from the latter by more numerous and less scattered fructifications which are more cylindric in the case of most species, and in having the gregarious fructifications seated on a more or less manifest mycelium. The

priority of Persoon's publication of *Solenia* is clearly established by Hoffmann's own work, for on the page of text following plate 8 he gives the full title of Persoon's work and its place of publication.

KEY TO THE SPECIES

- Spores white.....1
 Spores colored.....11. *S. endophila*
 1. Fructifications white or but slightly cream-colored.....2.
 1. Fructifications colored.....3.
 2. Fructifications white, scattered, cylindric, mouth not contracted; spores subglobose.....1. *S. candida*
 2. Fructifications white, fasciculate, mouth contracted; spores subglobose.....2. *S. fasciculata*
 2. Fructifications straw-color or shining white; in California....12. *S. gracilis*
 2. Fructifications white, crowded, confluent into a reticulate form; spores $4\frac{1}{2}$ -5 \times 4-4 $\frac{1}{2}$ μ3. *S. polyporoidea*
 2. Fructifications densely crowded, slightly tinted with cream; spores 4-6 \times 2-3 μ4. *S. conferta*
 2. Fructifications white, cylindric, villose; in Sweden.....13. *S. villosa*
 3. Fructifications ochraceous; spores 10-11 \times 4 $\frac{1}{2}$ μ ; on stems of ferns.....5. *S. filicina*
 3. Fructifications sulphur-colored; spores subglobose....6. *S. sulphurea*
 3. Fructifications some shade of brown; spores 6-11 \times 1 $\frac{1}{2}$ -4 $\frac{1}{2}$ μ7. *S. anomala*
 3. Fructifications pallid neutral gray, cylindric-clavate or pyriform; spores 9 \times 5 $\frac{1}{2}$ μ ; in California.....8. *S. cinerea*
 3. Fructifications cinereous, cup-shaped, sessile; spores 4 $\frac{1}{2}$ -6 $\frac{1}{2}$ \times 4 $\frac{1}{2}$ -5 μ9. *S. poriaeformis*
 3. Fructifications partially buried in the subiculum; spores 5-6 \times 3 μ ; in Venezuela.....10. *S. subporiaeformis*

1. *Solenia candida* Persoon, Roemer Neues Mag. Bot. 1: 116. 1794; Syn. Fung. 676. 1801; Myc. Eur. 1: 334. 1822; Hoffmann, Deutschl. Fl. 2: pl. 8, f. 1. 1795; Fries, Syst. Myc. 2: 200. 1823; Hym. Eur. 596. 1874; Sacc. Syll. Fung. 6: 424. 1888; Bourdot & Galzin, Soc. Myc. Fr. Bul. 26: 226. 1910; Rea, Brit. Basid. 702. 1922.

Fructifications scattered or solitary, 2-3 mm. high, cylindric, shining white, glabrous; spores hyaline, even, 4-5 \times 3 $\frac{1}{2}$ -4 μ .

On rotten wood, New York to Louisiana, and on palm in Bermuda. August to December. Rare.

The specimens which I have referred to *S. candida* are white when fresh but becoming pale pinkish buff in the herbarium, uniformly cylindric, often only 1 mm. long by 150 μ in diameter,

and notable by the mouths being nearly or quite the full diameter of the cavity of the fructification, as though the fructification were truncate. In Hoffmann's illustration, cited for *S. candida* by Persoon in his following works, the enlarged figure shows the fructifications as true cylinders with mouths open the full width of the cavity. In this figure the fructifications are enlarged to length of about 4 mm. and diameter of about 1 mm. and about the same distance apart as their length. In the collections which I refer to *S. candida*, the fructifications may be closer together than their length but always with small spaces between the fructifications, which are soft and crush easily under the cover glass in preparations.

Specimens examined:

New Hampshire: Hanover, *G. R. Lyman*, 32 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61693).

New York: Buffalo, *G. W. Clinton* (in U. S. Dept. Agr. Herb., under the name *Solenia fasciculata*, and in Burt Herb.); East Galway, *E. A. Burt*.

Louisiana: St. Martinville, *A. B. Langlois*, 1743.

Bermuda: *S. Brown*, *N. L. Britton* & *F. J. Seaver*, 1499 (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61649).

2. *S. fasciculata* Persoon, Myc. Eur. 1: 335. pl. 12, f. 8 and 9. 1822; Fries, Syst. Myc. 2: 200. 1823; Hym. Eur. 596. 1874; Schweinitz. Am. Phil. Soc. Trans. N. S. 4: 180. 1832; Morgan, Cincinnati Soc. Nat. Hist. Jour. 9: 7. 1886; Sacc. Syll. Fung. 6: 424. 1888; Bourdot & Galzin, Soc. Myc. Fr. Bul. 26: 225. 1910; Rea, Brit. Basid. 702. 1922.—An *Solenia gracilis* Cope-land, Ann. Myc. 2: 508. 1904?

Fructifications gregarious and usually fasciculate, cylindrical-clavate, somewhat enlarged towards the apex, 2-7 mm. high, white, minutely silky, almost smooth, sometimes rising from a thin, white mycelium; spores of European specimens white, even, $4-5\frac{1}{2} \times 3-4 \mu$, $4-6 \times 3-5 \mu$ in American specimens.

The specimens of *S. fasciculata* from France, sent to me by Bourdot and determined by him, have retained their white color for the seven years since gathered; they are seated on a white subiculum, common to the group of fructifications, and are

soft and easily crushed under the cover-glass in preparations and the hairs on the outside of the fructifications are colorless and soft in my preparations stained with eosin. The American specimens become pallid in the herbarium in a short time and may have spores slightly larger than European specimens. Two of our gatherings cited below have still the thin mycelium or subiculum, common to small groups of young fructifications; this apparently disappears as the fructifications become older and is not evident in most gatherings. The diameter of the mouth is somewhat smaller than that of the cavity into which it opens in this species, so that the apex is merely obtuse.

Specimens examined:

Exsiccati: Ellis, N. Am. Fungi, 937, under the name *Solenia villosa*; Ravenel, Fungi Car. 4: 21.

France: Loubotis, *A. Galzin*, 18240, 18241, comm. by H. Bourdot, 16094 and 15752 respectively.

Canada: Toronto, *J. H. Faull*, Univ. Toronto Herb., 640 (in Mo. Bot. Gard. Herb., 44909).

Vermont: Middlebury, *E. A. Burt*, three gatherings.

New York: Altamont, *E. A. Burt*; East Galway, *E. A. Burt*.

New Jersey: Newfield, Ellis & Harkness, in Ellis, N. Am. Fungi, 937.

Virginia: Mountain Lake, *W. A. Murrill*, 403 in part (in Mo. Bot. Gard. Herb., 54531).

South Carolina: *H. W. Ravenel*, in Ravenel, Fungi Car. 4: 21.

Florida: Daytona, *R. Thaxter*, comm. by Farlow Herb., 234 (in Mo. Bot. Gard. Herb., 63044).

Louisiana: St. Martinville, *A. B. Langlois*, 2998.

3. *S. polyporoidea* Peck, Mss. n. sp.

Solenia villosa Fr. var. *polyporoidea* Peck, N. Y. State Mus. Rept. 41: 86. 1888.

Type: in N. Y. State Mus. Herb.

At first granuliform and distinct, finally confluent along the sides in contact and forming a more or less connected, reticulate layer with the bare wood showing in many little areas $\frac{1}{2}$ -1 mm. in diameter; no subiculum present; fructifications pure white, sessile, tubular, 700 μ long, 200-300 μ in diameter, about 5 to a

mm. where confluent, the free surfaces of the exterior clothed with weak, matted, hyaline, even hairs up to $30\ \mu$ long by $1\ \mu$ in diameter; spores copious, hyaline, even, subglobose, slightly flattened on one side, $4\frac{1}{2}$ – 5×4 – $4\frac{1}{2}\ \mu$.

Covering areas 3–7 cm. long, $\frac{1}{2}$ cm. broad.

On decorticated, decaying wood of *Tsuga*. Adirondack Mountains, New York.

The hairs on the exterior are like ordinary hyphae of the walls and radiate outward only up to $30\ \mu$ rather than like the much larger, distinctive, external hairs of *C. fasciculata*; the cups are so firmly grown together that they are more or less mutilated and the walls torn in teasing the fructifications apart with needles under the dissecting microscope when immersed in water. This species is noteworthy by the confluence of the cups as well as by the matted, weak hairs.

Specimens examined:

New York: Adirondack Mts., *C. H. Peck*, type (in N. Y. State Mus. Herb.).

4. *S. conferta* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb.

Fructifications crowded, sometimes up to 4 to a mm. and then somewhat confluent, cylindric, white with slight creamy tint, clothed with slender, appressed, even hairs $75 \times 2\frac{1}{2}$ – $3\ \mu$, subhyaline, slightly yellowish in preparations stained with eosin; basidia simple, 12 – $15 \times 4\ \mu$, with 4 sterigmata; spores white in a spore collection, even, 4 – 6×2 – $3\ \mu$.

Fructifications about 1 mm. high, 200 – $300\ \mu$ in diameter, covering areas 10 cm. or more in diameter.

On rotten wood. Alabama and Missouri. November.

This species may be only a small-spored form of *S. fasciculata* but it seems to me distinct by its fructifications becoming densely crowded and somewhat confluent, by the smaller spores, and by the hairs being slightly yellowish. It was distributed by Ravenel under the name *S. villosa*, with the European concept of which it does not agree. Where most densely crowded, the fructifications shrink apart in drying, showing bare areas of wood as in *S. polyporoidea* from which *S. conferta* differs in oblong

spores and larger, true, external hairs and less marked confluence of fructifications.

Specimens examined:

Exsiccati: Ravenel, Fungi Car. 5: 42, under the name *Solenia villosa*.

Alabama: Peters, in Ravenel, Fungi Car. 5: 42.

Missouri: Meramec Highlands, L. O. Overholts, type (in Mo. Bot. Gard. Herb., 14505).

5. *S. filicina* Peck, N. Y. State Mus. Rept. 28: 52. 1876; Sacc. Syll. Fung. 6: 426. 1888.

An *S. villosa* Fr? var., Bourdot & Galzin, Soc. Myc. Fr. Bul. 26: 225. 1910?

Type: in N. Y. State Mus. Herb.

"Cups springing from an ochraceous, white-margined, tomentose subiculum, elongated, clavate or cylindrical, deflexed, clothed with appressed hairs or tomentum, ochraceous; spores hyaline, broadly fusiform, containing one or two nuclei," even, $10-11 \times 4\frac{1}{2} \mu$; basidia simple.

Fructifications about 250-350 μ in diameter.

Base of living fern stems. Lake Pleasant, New York. August.

Peck noted that the basal part of the cups sometimes turns brown and shrinks in drying so that they appear stipitate. In the course of nearly fifty years, the subiculum and cups have become clay color with the margin paler. The hairs clothing the fructifications are only very slightly colored, even, flexuous, $75-85 \times 3-3\frac{1}{2} \mu$, tapering to a sharp tip; the spores are not curved but straight, with equal sides, tapering to both base and apex.

Specimens examined:

New York: Lake Pleasant, C. H. Peck, type (in N. Y. State Mus. Herb.).

6. *S. sulphurea* Saccardo & Ellis, Michelia 2: 564. 1882; Sacc. Syll. Fung. 6: 426. 1888.

Type: probably in Saccardo Herb., and N. Y. Bot. Gard. Herb.

Fructifications gregarious, sometimes rather crowded and up to 2-3 to a mm., cup-shaped, short-stemmed, sulphur-colored,

fading in the herbarium, strigose-pilose, the margin whitish fringed; hairs minutely rough, flexuous, $75-90 \times 4-4\frac{1}{2} \mu$, sharp-pointed; spores hyaline, even, subglobose, $6-7\frac{1}{2} \mu$ in diameter, copious.

Fructifications $250-400 \mu$ in diameter and of about the same height.

On dead places in living trunk of *Magnolia glauca*. Newfield, New Jersey. January and April. Apparently local.

The specimens which I have seen were collected forty years ago and now show only traces of the original color, which is noted on the packets as "yellowish white when fresh, with white fringed margin, and disk white or nearly so." The larger globose spores should distinguish this species from *Cyphella sulphurea* and *C. laeta*.

Specimens examined:

New Jersey: Newfield, *J. B. Ellis*, four gatherings (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 61697-61700).

7. *S. anomala* (Pers.) Fuckel, *Symb. Myc.*, App. 1: 290. 1872; Fries, *Hym. Eur.* 596. 1874; Sacc. *Syll. Fung.* 6: 427. 1888; Bourdot & Galzin, *Soc. Myc. Fr. Bul.* 26: 227. 1910; Rea, *Brit. Basid.* 702. 1922.

Peziza anomala Persoon, *Obs. Myc.* 1: 29. 1796; *Syn. Fung.* 656. 1801; Fries, *Syst. Myc.* 2: 106. 1823.—*P. stipata* Persoon, *Myc. Eur.* 1: 270. 1822.—*Solenia ochracea* Hoffmann, *Deutschl. Fl.* 2: pl. 8, f. 2. 1795; Persoon, *Syn. Fung.* 675. 1801; *Myc. Eur.* 1: 334. 1822; Fries, *Syst. Myc.* 2: 201. 1823; *Hym. Eur.* 596. 1874; Morgan, *Cincinnati Soc. Nat. Hist. Jour.* 9: 8. 1886; Sacc. *Syll. Fung.* 6: 425. 1888; Karsten, *Finska Vet.-Soc. Bidrag Natur och Folk* 48: 283. 1889; Bourdot & Galzin, *loc. cit.*—*S. anomaloides* Peck, *Torr. Bot. Club Bul.* 25: 326. 1898; Sacc. *Syll. Fung.* 16: 173. 1902.—*S. anomala* var. *ochracea* (Hoffm.) Berk. in Rea, *loc. cit.*—An *S. confusa* Bresadola, *Ann. Myc.* 1: 84. 1903?

Fructifications drying Dresden brown, snuff-brown, or Rood's brown, turbinate or pyriform, crowded or scattered, clothed with thick-walled hairs $2\frac{1}{2}-3 \mu$ in diameter which give their color

to the fructifications and at the apex of the fructifications are often rough-walled near their tips; hymenium paler, urceolate, the margin incurved; basidia simple, with 4 sterigmata; spores hyaline, even, cylindric, curved, $6-11 \times 1\frac{1}{2}-4\frac{1}{2} \mu$.

Fructifications in dried condition $\frac{1}{2}-1$ mm. high, 200-300 μ in diameter, where crowded 3-4 to a mm.

Usually crowded into small areas on pustules or crevices in the bark of dead twigs of *Alnus*, *Prunus*, *Quercus*, *Betula*, *Salix*, etc., or covering broad areas of decorticated wood, fewer and more scattered when the wood is very rotten. Throughout Europe, Newfoundland to Louisiana, westward to Oregon and British Columbia, and in Porto Rico. August to May. Common.

European specimens of *S. anomala* in the exsiccati cited below have somewhat larger spores than those of gatherings from eastern United States but do not differ at all from those of the extreme West. Those from British Columbia have spores $7-10 \times 4-4\frac{1}{2} \mu$ and hairs rough near the tips, agreeing in both respects with the Westendorp distribution from Belgium. In one Colorado and one Montana gathering the spores are 3 μ thick, as in those of the Berkeley and the Libert distributions, and in another Colorado specimen $3-3\frac{1}{2} \mu$ thick as in the Cavara distribution. They are $2\frac{1}{2} \mu$ thick in two Montana gatherings and in the Rabenhorst distribution, although many of the latter are only 2 μ thick as is the usual thickness of spores of New York and New England gatherings. In my opinion these spore differences do not warrant specific distinction, and I doubt furthermore whether *S. confusa* of Europe, separated from *S. anomala* on the sole ground of spores $7-10 \times 2-2\frac{1}{2} \mu$, is really distinct from the latter. The distributions by Berkeley, Libert, and Cavara are true intermediates.

Specimens examined:

Exsiccati: Bartholomew, Fungi Col., 2085, under the name *S. ochracea*; Berkeley, Brit. Fungi, 260; Cavara, Fungi Longobardiae, 108; Cooke, Fungi Brit., 405, under the name *S. ochracea*; Desmazières, Crypt. France, 1059; Ellis, N. Am. Fungi, 611, under the name *S. ochracea*; Reliquiae Farlowianae, 363; Karsten, Fungi Fenniae Exs., 7; Kunze, Fungi Sel. Exs., 301; Libert, Pl. Crypt. Arduennae, 227; Rabenhorst, Herb.

- Myc., 307; Ravenel, *Fungi Car.* 4: 7; Saccardo, *Myc. Veneta*, 1407, 1408; Sydow, *Fungi Exotici*, 323; Westendorp, *Herb. Crypt. Belge*, 398.
- Finland: *P. Karsten*, in *Karsten, Fungi Fenniae Exs.*, 7.
- Sweden: Tyroso, *L. Romell, No. A in part*.
- Germany: Dresden, in *Rabenhorst, Herb. Myc.*, 307.
- Austria: Sonntagberg, *P. Strasser* (in *Mo. Bot. Gard. Herb.*, 42683).
- Switzerland: *G. Winter*, in *Kunze, Fungi Sel. Exs.*, 301.
- Italy: Padua, in *Cavara, Fungi Longobardiae*, 108; in *Saccardo, Myc. Veneta*, 1407, 1408.
- France: in *Desmazières, Crypt. France*, 1059; in *Libert, Pl. Crypt. Arduennae*, 227.
- Belgium: Bruges, in *Westendorp, Herb. Crypt. Belge*, 398.
- England: in *Berkeley, Brit. Fungi*, 260; *Shrewsbury, W. Phillips*, in *Cooke, Fungi Brit.*, 405, under the name *S. ochracea*.
- Newfoundland: Bay of Islands, *A. C. Waghorne* (in *Mo. Bot. Gard. Herb.*, 4601).
- Canada: Ontario, Kenora, *A. H. R. Buller*, 559 (in *Mo. Bot. Gard. Herb.*, 58979); London, *J. Dearness*, in *Bartholomew, Fungi Col.*, 2085, and *Sydow, Fungi Exotici*, 323.
- Maine: Kittery Point, *R. Thaxter & E. A. Burt*.
- Vermont: Middlebury, *E. A. Burt*, three collections.
- Massachusetts: Arlington, *E. A. Burt*; Cambridge, *M. A. Barber*; Milton, *H. Webster*, 800; Newton, *M. A. Barber* (in *Mo. Bot. Gard. Herb.*, 3913); Sharon, *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 62749); *A. P. D. Piguet*, in *Reliquiae Farlowianae*, 363.
- New York: Bronx Park, *W. A. Murrill* (in *N. Y. Bot. Gard. Herb.*, and *Mo. Bot. Gard. Herb.*, 61688); Syracuse, *A. H. W. Povah*, 890 (in *Mo. Bot. Gard. Herb.*, 58175); *L. M. Underwood* (in *N. Y. Bot. Gard. Herb.*, and *Mo. Bot. Gard. Herb.*, 61690); White Plains, *L. M. Underwood* (in *Mo. Bot. Gard. Herb.*, 61687).
- Pennsylvania: Bethlehem, *Ellis & Harkness*, in *Ellis, N. Am. Fungi*, 611.
- South Carolina: *H. W. Ravenel*, in *Ravenel, Fungi Car.* 4: 20.
- Louisiana: St. Martinville, *A. B. Langlois*.

- Michigan: *Beal*, 214, type of *Solenia anomaloides* (in N. Y. State Mus. Herb.).
- Iowa: Webster County, *O. M. Oleson*, 446 (in Mo. Bot. Gard. Herb., 14556); Woodbine, *Humphrey & Edgerton*, comm. by C. J. Humphrey, 6510 (in Mo. Bot. Gard. Herb., 42920).
- Missouri: Concordia, *Demetrio* (in Mo. Bot. Gard. Herb., 4592); Creve Coeur, *S. M. Zeller*, 1567 (in Mo. Bot. Gard. Herb., 55567).
- Nebraska: Lincoln, *L. B. Walker* (in Mo. Bot. Gard. Herb., 55016).
- Colorado: Geneva, *F. J. Seaver & E. Bethel* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61692); Tolland, *F. J. Seaver & E. Bethel* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61691).
- Montana: Choteau, *J. A. Hughes*, comm. by J. R. Weir, 5489 (in Mo. Bot. Gard. Herb., 55947); Helena, *F. D. Kelsey* (in Mo. Bot. Gard. Herb., 62750); Missoula, *J. R. Weir*, 424 (in Mo. Bot. Gard. Herb., 22430); Sheridan, *Miss Fitch* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 61689).
- Oregon: Corvallis, *S. M. Zeller*, 2064 (in Mo. Bot. Gard. Herb., 57504).
- British Columbia: Sidney, *J. Macoun*, 67 (in Mo. Bot. Gard. Herb., 5745); Victoria, *J. Macoun*, 563 (in Mo. Bot. Gard. Herb., 55308).
- Porto Rico: Rio Piedras, *J. A. Stevenson & R. C. Rose*, 6532 (in Mo. Bot. Gard. Herb., 55657).
- Jamaica: Chester Vale, *W. A. & E. L. Murrill*, 347, comm. by N. Y. Bot. Gard. Herb.

8. *S. cinerea* Burt in Millspaugh & Nuttall, Flora Santa Catalina Island, 315. 1922.

Type: in Field Mus. Nat. Hist. Herb. and Mo. Bot. Gard. Herb.

Fructifications cespitose, 30-100 in dense circular clusters on cracks and pustules of the bark, short-stipitate, cylindrical-clavate or pyriform, pallid neutral gray of Ridgway, minutely hairy, the apex obtuse and pore nearly closed; surface hairs colored, flexuous, $100 \times 3\frac{1}{2} \mu$, paler towards the tips and there rough-

walled; basidia simple, $30 \times 6 \mu$, with 4 slender sterigmata; spores hyaline, even, cylindric or slightly curved, $7\frac{1}{2}$ – 10×4 – $5\frac{1}{2} \mu$, usually $9 \times 5\frac{1}{2} \mu$.

Fructifications 700 μ high, 200–300 μ in diameter.

On bark of rotting oak. California. May.

The fructifications are colored like those of *S. poriaeformis* but in other respects are more like *S. anomala* when growing on pustules and crevices of the bark.

Specimens examined:

California: Avalon, Santa Catalina Island, *L. W. Nuttall*, 396, type (in Field Mus. Nat. Hist. Herb., and Mo. Bot. Gard. Herb., 57610).

9. *S. poriaeformis* (Pers.) Fries, Hym. Eur., 597. 1874; Winter in Rabenhorst, Krypt.-Fl. 1: 391. 1884; Bourdot & Galzin, Soc. Myc. Fr. Bul. 26: 226. 1910.

Peziza poriaeformis Pers. γ of *Peziza anomala* Pers. Syn. Fung. 656. 1801.—*P.?* *poriaeformis* (Pers.) De Candolle, Fl. France 6: 26. 1815; Fries, Syst. Myc. 2: 106. 1823.—*P. tephrosia* Pers. Myc. Eur. 1: 271. 1822.—*Solenia poriaeformis* (DC.) Fuckel, Symb. Myc. App. 1: 290. 1872.—Sacc. Syll. Fung. 6: 428. 1888; Coker, Elisha Mitchell. Scientif. Soc. Jour. 36: 151. pl. 15, pl. 30. f. 4–6. 1921; Rea, Brit. Basid. 703. 1922.—An *Peziza pruinata* Schweinitz, Naturforsch. Ges. Leipzig Schrift. 1: 120. 1822?—An *P. Daedalea* Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 174. 1832?

Illustrations: Brefeld, Untersuch. Myk. 7: pl. 11, f. 21. 1888; Coker, loc. cit.

Fructifications about 1 mm. high, cinereous, light neutral gray or hair-brown, cup-shaped, sessile, hairy, more or less crowded, 2–4 to a mm., seated on a grayish mycelium; hymenium pale gray, concave; flesh thin, brownish; basidia simple, with 2–4 sterigmata; spores hyaline, even, subglobose, $4\frac{1}{2}$ – $6\frac{1}{2} \times 4\frac{1}{2}$ – 5μ .

On decaying limbs and logs of frondose species. Europe, New Jersey to Alabama, and in Minnesota. April to January. Infrequent.

This species covers small areas 1–3 cm. long by $\frac{1}{2}$ –1 cm. broad on bark of oak, birch, maple, grape, etc. It has the aspect of a

cinereous, crustaceous lichen bearing numerous small apothecia. It is distinguished from *S. subporiaeformis* by larger cups and more globose spores. I failed to study the authentic specimens of *Peziza Daedalea* Schw. and *Peziza pruinata* Schw. when there was an opportunity.

Specimens examined:

Exsiccati: Ell. & Ev., N. Am. Fungi, 2317; Jaap, Fungi Sel.

Exs., 65; Ravenel, Fungi Car. 1: 38, under the name *Peziza pruinata* Schw.; Ravenel, Fungi Car. 1: 37, under the name *Peziza Daedalea* Schw.

Sweden: Femsjö, *L. Romell*.

Germany: Brandenburg, in Jaap, Fungi Sel. Exs., 65.

France: Aveyron, *A. Galzin*, 1784, comm. by H. Bourdot, 4747.

New Jersey: Newfield, *J. B. Ellis*, in Ell. & Ev., N. Am. Fungi, 2317.

Maryland: Takoma Park, *C. L. Shear*, 1087.

North Carolina: Chapel Hill, *W. C. Coker*, 4686 (in Mo. Bot. Gard. Herb., 57331).

South Carolina: *H. W. Ravenel*, in Ravenel, Fungi Car. 1: 37, 38.

Alabama: Auburn, *F. S. Earle* (in N. Y. Bot. Gard. Herb., and Mo. Bot. Gard. Herb., 57330).

Minnesota: Vermilion Lake, *E. W. D. Holway* (in U. S. Dept. Agr. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 4800), and *J. C. Arthur*, *L. H. Bailey* & *E. W. D. Holway*, 2548 (in Mo. Bot. Gard. Herb., 4599).

10. *S. subporiaeformis* Burt, n. sp.

Type: in Farlow Herb. and Mo. Bot. Gard. Herb.

Fructifications spherical, 120–150 μ in diameter, 4–5 to a mm., nearly buried in the pale neutral gray subiculum, with the white mouths and adjacent portion of the wall protruding; mouth about 60–80 μ in diameter; hymenium black as seen from above, the subhymenium opaque, nearly black; basidia simple, pyriform, 9–12 \times 5–6 μ ; spores hyaline, even, flattened on one side, 5–6 \times 3 μ .

Fructifications in small patches 4 \times 3 cm., 3 \times 2 cm., and 3 \times 1½ cm. in the three specimens collected.

On decorticated, very rotten wood. Margarita Island, Venezuela. July.

This species is closely related to *S. poriaeformis*, but may be distinguished from the latter by smaller, partially buried fructifications, smaller basidia, and smaller spores of elongated rather than subglobose form. It may possibly range farther north into the West Indies.

Specimens examined:

Venezuela: Margarita Island, *A. F. Blakeslee*, type (in Farlow Herb., and Mo. Bot. Gard. Herb., 56064).

11. *S. endophila* (Ces.) Fries, Hym. Eur. 705. 1874; Sacc. Syll. Fung. 6: 427. 1888.

Cyphella endophila Cesati in Rabenhorst, Fungi Eur., 1513, with description. 1872; Mattiolo, Accad. Scienze Torino Atti 22:—pl. 4. 1887.

Type: type distribution in Rabenhorst, Fungi Eur., 1513.

Fructifications densely crowded together, curving upward from a continuous carpet (often evanescent) of short, suberect, colored hyphae, furfuraceous-villose, at first whitish, becoming ochraceous when old, attenuated towards the base into a short stem; the disk rather pale; hairs colored, even, flexuous, 40–45 \times 3–4½ μ ; basidia simple, 12–14 \times 4½–5 μ ; spores colored, even, 6–7 \times 4–5 μ , copious.

Fructifications 1 mm. long, 200–300 μ in diameter, usually somewhat scattered but crowded in some places up to 2–3 to a mm.

On rotten, decorticated wood and bark of *Populus* and other frondose species. Southern Europe, Maine, Vermont, Florida, Colorado, and South America. August to March. Rare.

A great deal of powdery matter covers the hairy fructification and is the cause of its whitish color. *S. endophila* is readily distinguished from our other species by its colored spores.

Specimens examined:

Exsiccati: Rabenhorst, Fungi Eur., 1513, type distribution; Theissen, Dec. Fung. Brasiliun, 165.

Italy: *Cesati*, in Rabenhorst, Fungi Eur., 1513.

Maine: Kittery Point, *R. Thaxter*, comm. by W. G. Farlow, 1 (in Mo. Bot. Gard. Herb., 43804).

Vermont: Middlebury, *E. A. Burt*.

Florida: Palm Beach, *R. Thaxter*, comm. by Farlow Herb., 247 (in Mo. Bot. Gard. Herb., 63046).

Colorado: Denver, *F. J. Seaver* & *E. Bethel* (in N. Y. Bot. Gard. Herb., Burt Herb., and Mo. Bot. Gard. Herb., 61695).

Venezuela: Margarita Island, *A. F. Blakeslee*, comm. by Farlow Herb. (in Mo. Bot. Gard. Herb., 56067).

Brazil: *Rick*, in Theissen, Dec. Fung. Brasiliium, 165.

SPECIES IMPERFECTLY KNOWN

12. *S. gracilis* Copeland, Ann. Myc. 2: 508. 1904; Sacc. Syll. Fung. 21: 362. 1912.

"Sparsa; cupulis primo urceolatis, brevissime stipitatis, demum cylindraceutis, denique late sessilibus, sursum attenuatis, oribus incrassatis, integris, glabris, stramineis nitentibus, vel candidis et deorsum fusciscentibus, 0.5 mm. altis; sporis globosis, 7.5-8 μ diam.

"Ad lignum putridum *Alni*. Saratoga." [California.]

13. *S. villosa* Fries, Syst. Myc. 2: 200. 1823; Hym. Eur. 596. 1874; Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 180. 1832; Sacc. Syll. Fung. 6: 425. 1888.

Fructifications gregarious, cylindric, villose, white. Related to the preceding species (*S. candida*, *S. fasciculata*, *S. pallens*) but a little larger, distinctly villose, by this approaching *S. ochracea*. On fallen rotten wood.

The above is a translation of the original description, to which I have found no distinctive additions from later European research. The description is given here because American mycologists have so frequently referred gatherings to *S. villosa*, a species which seems to be imperfectly known in its own country.

MATRUCHOTIA, MICROSTROMA, PROTOCORONOSPORA

Matruchotia varians Boulanger, Rev. Gen. Bot. 5: 401. pl. 12-14. 1893; Rev. Myc. 16: 68. pl. 142-144. 1894. Sacc. Syll. Fung. 11: 118. 1895.

Under the above name Boulanger described as a new genus and new species a fungus of soft consistency and aspect of the

Hyalostilbeae but having spores borne one or two to a sporophore—usually but one. This fungus appeared in cultures of the bark of *Piscidia erythrina*, used in pharmacy and obtained from South America northward to Florida. On account of sometimes two spores to a spore-bearing cell Boulanger would class *Matruchotia* as a Basidiomycete—as an intermediate connecting the Basidiomycetes with the Hyphomycetes and showing their phylogenetic origin from the latter.

The account and illustrations present *Matruchotia* as having an erect trunk composed of cohering hyphae, branched above, and bearing spores along the sides of the trunk and branches and at the tips of the final branchlets.

I am disposed to regard *Matruchotia* as a genus of the *Stilbiaceae* and do not attach great importance to the fact that the spores are sometimes in twos.

The range of *Matruchotia* is northward to Maine at least and on other kinds of wood than *Piscidia*, for while collecting at Kittery Point with Professor Thaxter we found plentifully there a soft, white, mucedinous fungus which he recognized as *Matruchotia*.

Microstroma Niessl, Mähr. Crypt. Fl., 163. 1861; Sacc. Syll. Fung. 4: 9. 1886; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 105. 1898.

This genus is represented in North America by *M. albus*, *M. Juglandis*, *M. leucosporum*, *M. americanorum*, and *M. inguinicola*. The more frequent species occur as small white patches on living leaves of *Carya*, *Juglans*, *Quercus*, etc. Some authors have referred *Microstroma* to the Basidiomycetes on account of several spores being produced at the apex of the spore-bearing cell. R. Maire, Rec. publ. Occ. Jubilé sc. Prof. Le Monnier 131–139. 1913, concludes that *Microstroma* is not a Basidiomycete but one of the *Melanconieae*.

Protocoronospora Atkinson & Edgerton, Jour. Myc. 13: 186. 1907; Sacc. Syll. Fung. 21: 421. 1912; Wolf, Elisha Mitchell Scientif. Soc. Jour. 36: 82. 1920.

The type species, *Protocoronospora nigricans* Atk. & Edg., is a virulent parasite on all parts above ground, including the pods, of *Vicia sativa* and *V. villosa*. *Protocoronospora* was proposed as

a genus of the *Thelephoraceae* because the spores are borne in a whorl at the apex of the spore-bearing cell. Wolf, *loc. cit.*, has presented the morphology and development of *P. nigricans* and concludes that *Protocoronospora* is not a Basidiomycete but one of the *Melanconieae*, a conclusion in which I concur.

ASTEROSTROMA

Asterostroma Masee, Linn. Soc. Bot. Jour. 25: 154. *pl.* 46, *f.* 8, 9. 1889; Sacc. Syll. Fung. 9: 236. 1891; Engl. & Prantl, Nat. Pflanzenfam. (1:1**): 122. 1898; Bourdot & Galzin, Soc. Myc. Fr. Bul. 36: 44. 1920.

Fructifications resupinate, effused, dry, composed of loosely interwoven hyphae, some of which terminate in brown, stellate organs composed of slender rays; basidia simple, with 2-4 sterigmata; spores hyaline.

The species of *Asterostroma* are likely to be referred to *Corticium* unless sections are examined. In sections the brown, stellate organs are conspicuous when viewed with the microscope and sharply separate *Asterostroma* from other resupinate thelephoraecous fungi. Similar organs occur, however, in *Asterodon* of the *Hydnaceae* and in a species of *Lachnocladium*.

KEY TO THE SPECIES

- No colored hyphae present in the subiculum.....1
 Some colored hyphae in subiculum.....6. *A. ochrostroma*
 1. Spores becoming echinulate.....2
 1. Spores even.....3
 2. Stellate organs with unbranched rays as a rule.....1. *A. cervicolor*
 2. Many stellate organs have some rays branched.....2. *A. muscicolum*
 3. Hymenium drying whitish; no cystidia; rays $3\frac{1}{2}$ - $4\frac{1}{2}$ μ in diameter.....3. *A. bicolor*
 3. Like *A. bicolor* except that rays up to $130 \times 9 \mu$ protrude beyond hymenium, like setae.....4. *A. spiniferum*
 3. Stellate organs have notably long, slender rays up to 100 - 150×3 - $3\frac{1}{2}$ μ ; fructification not spongy.....5. *A. gracile*

1. *Asterostroma cervicolor* (Berk. & Curtis) Masee, Linn. Soc. Bot. Jour. 25: 155. 1889; Sacc. Syll. Fung. 9: 237. 1891; Bourdot & Galzin, Soc. Myc. Fr. Bul. 36: 44. 1920.

Corticium cervicolor Berk. & Curtis, Grevillea 1: 179. 1873; Sacc. Syll. Fung. 6: 621. 1888.—*Asterostroma corticola* Masee, Linn. Soc. Bot. Jour. 25: 155. 1889; Sacc. Syll. Fung. 9: 236.

1891.—*A. albido-carneum* Masee, Linn. Soc. Bot. Jour. 25: 155. *pl. 46. f. 8, 9.* 1889. Not *Thelephora albido-carnea* Schweinitz, Am. Phil. Soc. Trans. N. S. 4: 169. 1832.—*A. pallidum* Morgan, Cincinnati Soc. Nat. Hist. Jour. 18: 38. *pl. 1, f. 6.* 1895; Sacc. Syll. Fung. 14: 223. 1899.

Type: in Kew Herb. and Curtis Herb.

Fructification effused, thin, spongy, dry, avellaneous to cinnamon-drab within, the margin fibrillose-floccose, paler; hymenium even, pulverulent, becoming pallid where well-fruited; structure in section 150–300 μ thick, composed of thin-walled, loosely arranged, hyaline hyphae 2–2½ μ in diameter and of conspicuous, colored, thick-walled, rigid, stellate organs with 3–7, usually about 5, unbranched rays 15–60 μ long and 3–3½ μ in diameter, distributed throughout the fructification; cystidia (gloeocystidia?) fusoid, often sharp-pointed, not incrustated, 30–45 \times 8–12 μ , protruding up to 25 μ above the basidia; basidia simple, with 4 sterigmata; spores white in spore collections, spherical, becoming echinulate, with the spore body 4–5 μ in diameter.

On decaying wood, earth, and on outside of a flower pot. Canada to Louisiana, in Washington, California, Mexico, West Indies, and Japan. July to March. Widely distributed but not abundant.

The color of this species varies somewhat with the presence and degree of development of the hymenium; young fructifications still lacking basidia or with only few scattered basidia have a tawny color due to the numerous colored stellate bodies which are present in the surface of the fructification. As the hymenium becomes continuous in patches or over the whole surface it conceals the stellate organs and shows as a whitish or pallid pellicle in the regions where developed, with comparatively few colored rays protruding through it. The type specimen of *A. pallidum* has the hymenium fully developed. Under my method of staining sections with eosin and then preserving in glycerine mounts, the fusoid organs in the hymenium are what I understand as non-incrustated cystidia containing little granular matter, a great deal of cell sap, and with such thin walls that they collapse in the glycerine preparations. Bourdot has a special reagent and method which he employs as a test for gloeocystidia, and he has decided that these organs are gloeocystidia.

The specimens of *A. ochroleuca* Bres. from France, communicated by Bourdot, seem to me specifically distinct from our *A. cervicolor* by their lack of the continuous, whitish hymenial pellicle and the abundant rays in the hymenial surface being well branched so that very many of them resemble antlers rather than stellate organs.

Specimens examined:

Exsiccati: Ravenel, *Fungi Am.*, 228, under the name *Corticium cervicolor*; Ravenel, *Fungi Car.* 4: 14, type distribution of *Asterostroma albido-carneum* Masee, under the name *Corticium albido-carneum* but not the species of Schweinitz.

Canada: St. Lawrence Valley, *J. Macoun*, 18.

New Hampshire: Chocorua, *E. A. Burt*, two collections; *W. G. Farlow*, 2a, 2b, an unnumbered specimen in *Burt Herb.*, and 2, 3, 155 and an unnumbered specimen (in *Mo. Bot. Gard. Herb.*, 55601, 55602, 55246, and 6883 respectively).

Massachusetts: Belmont, *W. G. Farlow*.

New York: Albany, *H. D. House & J. Rubinger* (in *N. Y. State Mus. Herb.*, and *Mo. Bot. Gard. Herb.*, 6327); East Galway, *E. A. Burt*.

Pennsylvania: Bethlehem, *Schweinitz* (in *Herb. Schweinitz* under the names *Thelephora reticulata* and *Thelephora mollis*).

District of Columbia: Washington, *J. R. Weir*, 19741 (in *Mo. Bot. Gard. Herb.*, 59167).

South Carolina: *H. W. Ravenel*, in *Ravenel, Fungi Car.* 4: 14.

Georgia: Darien, *H. W. Ravenel*, in *Ravenel, Fungi Am.*, 228.

Florida: *W. W. Calkins*, 150, comm. by *W. G. Farlow* (in *Mo. Bot. Gard. Herb.*, 44635); *Cutler Hammock*, *W. A. Merrill*, 85 (in *N. Y. Bot. Gard. Herb.*, and *Mo. Bot. Gard. Herb.*, 62104).

Alabama: *Peters*, type of *Corticium cervicolor* (in *Curtis Herb.*, 4026, and *Kew Herb.*); *Montgomery County*, *R. P. Burke*, 110 and 311 (in *Mo. Bot. Gard. Herb.*, 19896 and 57185 respectively).

Louisiana: St. Martinville, *A. B. Langlois*, ex, 1948, 203 (in *Burt Herb.*, *Lloyd Herb.*, 3144, and *Mo. Bot. Gard. Herb.*, 55621).

Ohio: Cincinnati, *C. G. Lloyd*.

Idaho: Priest River, *J. R. Weir*, 581 (in Mo. Bot. Gard. Herb., 63172).

Washington: Hoquiom, *C. J. Humphrey*, 6411.

California: *A. J. McClatchie*, type of *Asterostroma pallidum* (in Kew Herb., and Mo. Bot. Gard. Herb., 4792).

Mexico: Xuchiles, near Cordoba, *W. A. & E. L. Murrill*, 1206, 1212, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54593 and 54594 respectively); near Guernavaca, *W. A. & E. L. Murrill*, 516, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54517); Jalapa, *W. A. & E. L. Murrill*, 300, comm. by N. Y. Bot. Gard. Herb. (in Mo. Bot. Gard. Herb., 54444).

Porto Rico: Central Alianga, *J. A. Stevenson*, 6071 (in Mo. Bot. Gard. Herb., 54684); Rio Piedras, comm. by Mrs. F. W. Patterson.

Japan: Awaji, Mt. Mikuma, *A. Yasuda*, 38 (in Mo. Bot. Gard. Herb., 56170).

2. *A. muscicolum* (Berk. & Curtis) Masee, Linn. Soc. Bot. Jour. 25: 155. 1889.

Hymenochaete muscicola Berk. & Curtis, Linn. Soc. Bot. Jour. 10: 334. 1868; Sacc. Syll. Fung. 6: 602. 1888.

Type: in Kew Herb. and Curtis Herb.

Fructification broadly effused, thin, spongy, dry, wood-brown of Ridgway, the margin narrow, whitish; hymenium concolorous with the subiculum or but slightly paler, even; in structure in section 300–400 μ thick, composed of thin-walled, loosely arranged hyaline hyphae and of very numerous, colored, stellate organs with 3–9 rays, the rays about $30\text{--}45 \times 3\text{--}4\frac{1}{2}$ μ , sometimes unbranched but many branched, becoming smaller and more branched towards, and in, the hymenium and bearing secondary whorls of small branches or with 2 stellate organs connected by a short, thick axis; cystidia few, not incrusted, 6 μ in diameter, protruding up to 27 μ , tapering to a sharp point; spores hyaline, spherical, echinulate, the body 5–7 μ in diameter, the spines numerous, close together, very distinct.

Fructifications up to 7×4 cm. when well developed.

On dead branches of trees covered with moss, on cocanut

petioles, and on rotting wood. West Virginia, Arkansas, Louisiana, and the West Indies. July to December.

A. muscicolum has so many tough, stellate organs that it is not easy to cut sections free hand which are thin enough to show clearly the details of the hymenium; it differs in this respect from *A. cervicolor* and also by the very numerous, branched rays and the thicker-walled spores covered with stouter and more numerous spines.

Specimens examined:

West Virginia: Eglon, *C. G. Lloyd*, 1457 (in Mo. Bot. Gard. Herb., 55611).

Louisiana: *Dr. Hale* (under the name *Stereum Halei* in Kew Herb. and Curtis Herb., 3660); St. Martinville, *A. B. Langlois*, 2703.

Arkansas: Fordyce, *C. J. Humphrey*, 2530 (in Mo. Bot. Gard. Herb., 11952).

Cuba: *C. Wright*, 253, type of *Hymenochaete muscicola* (in Kew Herb. and Curtis Herb.); Ceballos, *C. J. Humphrey*, 2579 (in Mo. Bot. Gard. Herb., 14841); Habana Province, Fecha, *F. S. Earle*, 141.

Grenada: Grand Etang, *R. Thaxter*, comm. by W. G. Farlow, 15.

3. *A. bicolor* Ellis & Everhart, Acad. Nat. Sci. Philadelphia Proc. 1893: 441. 1893; Sacc. Syll. Fung. 11: 128. 1895.

Type: in N. Y. Bot. Gard. Herb., U. S. Dept. Agr. Herb., and Burt Herb.

Effused, thin, avellaneous when fresh, the hymenium becoming whitish in the herbarium, the margin thin, cobwebby; in structure in section 200–300 μ thick, composed of loosely arranged, hyaline hyphae 2–2½ μ in diameter and of rather scattered—not crowded—colored, stellate organs with unbranched rays 45–120 μ long, 3½–4½ μ in diameter; no cystidia; basidia with 4 sterigmata; spores white in a spore collection, even, globose, apiculate at the base, 5–7 μ in diameter.

Fructifications 1–6 cm. long, 1–4 cm. broad.

On rotten wood of both frondose and coniferous species but more abundant on the latter. New York to Louisiana and westward to British Columbia. August to November.

Specimens of *A. bicolor* acquire in the herbarium the whitish hymenium of a well-fruited *A. cervicolor* from which they are only distinguishable by the even spores and the absence of cystidia. On the basis of the similar spores, I formerly referred to *A. bicolor* a small specimen collected in Sweden by Romell. Bourdot has recently sent to me from France several specimens, published by him under the name *A. laxum* Bres., which are identical in structure with the specimen from Romell and constantly distinct from our *A. bicolor* by having occasional cystidia and stellate organs with branched rays—so conspicuously branched in the hymenium as to approach antler form.

Specimens examined:

New York: Floodwood, *E. A. Burt*.

Delaware: Wilmington, *Commons*, 2356, type (in N. Y. Bot. Gard. Herb., U. S. Dept. Agr. Herb., and Burt Herb.).

Maryland: Glen Sligo, *C. L. Shear*, 1141.

Louisiana: St. Martinville, *A. B. Langlois*, *ac.*

Kentucky: Crittenden, *C. G. Lloyd* (in Lloyd Herb., 1401, 1425, and Mo. Bot. Gard. Herb., 55616 and 55617 respectively).

Illinois: Christopher, *C. J. Humphrey*, 1991 (in Mo. Bot. Gard. Herb., 59018).

British Columbia: Kootenai Mts., near Salmo, *J. R. Weir*, 454, 495, 520, 541 (in Mo. Bot. Gard. Herb., 13274, 21977, 19438, and 3774 respectively).

4. *A. spiniferum* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb.

Fructifications effused, with the subiculum avellaneous and the hymenium pale pinkish buff; in structure 300–350 μ thick, with hyphae hyaline, arranged longitudinally along the substratum and passing into a loosely arranged layer and becoming intermixed with the colored, stellate organs; stellate organs not densely crowded together, with unbranched rays 50–90 \times 6–7 μ usually, but next to the hymenium having rays perpendicular to the latter, larger than the other rays, up to 130 \times 9 μ , and protruding beyond the basidia up to 110 μ , like setae; cystidia not incrustated, 25 \times 5 μ , sparingly present; spores hyaline, even, subglobose, 5–6 μ in diameter.

Fructifications up to 4 cm. long, 2 cm. broad.

On rotten wood. Porto Rico. July.

This species is related to *A. bicolor* but is distinct from the latter and noteworthy by the very large, unsymmetrical, seta-like rays which stand out above the general level of the hymenium. The occasional cystidia are an additional separating character.

Specimens examined:

Porto Rico: Rio Piedras, *J. A. Stevenson*, 5579, type (in Mo. Bot. Gard. Herb., 13415).

5. *A. gracile* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb.

Fructifications effused, very thin, cobwebby, delicate, with the subiculum light drab and the hymenium pale olive-buff, not continuous but with the basidia in clusters; in structure 150 μ thick, with hyphae loosely arranged, hyaline, 2-2½ μ in diameter, and with colored, stellate organs with central body 6 μ in diameter and very slender, unbranched rays up to 100-150 \times 3-3½ μ , often protruding beyond the hymenium up to 45 μ ; cystidia numerous, not incrusting, fusoid, 30 \times 8 μ ; basidia 15 \times 6 μ ; spores hyaline, even, spherical, 6 μ in diameter.

Fructifications ½-1 cm. in diameter.

On very rotten, frondose wood. Alabama. October.

The small gray fructifications of *A. gracile* have the aspect of a delicate, cobwebby Hyphomycete rather than the more compact, spongy structure of other species of this genus. The long, slender rays of the stellate organs and the cystidia are also distinctive.

Specimens examined:

Alabama: Montgomery County, *R. P. Burke*, 409, type (in Mo. Bot. Gard. Herb., 57202).

6. *A. ochrostroma* Burt, n. sp.

Type: in Mo. Bot. Gard. Herb., and Farlow Herb. probably.

Fructification effused, dry, felty, ochraceous tawny, with surface becoming shallowly granular in fruiting; in structure 200-300 μ thick, composed of both hyaline, thin-walled, flaccid hyphae 2 μ in diameter, and of some ochraceous, stiff, thick-walled hyphae 2 μ in diameter, and of very numerous, densely

crowded stellate organs of varying size; stellate organs with unbranched rays $20-60 \times 3-6 \mu$ which protrude beyond the hymenium in such great numbers and so crowded as to nearly conceal the basidia; no cystidia found; basidia simple, $10 \times 5 \mu$, with 4 sterigmata, but few basidia found; floating spores in each preparation are hyaline, even, $4-4\frac{1}{2} \times 3 \mu$, neither copious nor seen attached to basidia.

Fructifications $1-1\frac{1}{2}$ mm. long, about $\frac{1}{2}$ mm. broad.

On bark and decorticated wood of *Abies*. New Hampshire. September.

A. ochrostroma differs from all other species of *Asterostroma* known to me by the presence in its subiculum of some slender, rigid, thick-walled hyphae of the same diameter as the usual, thin-walled hyphae but of the same color as the stellate organs. I find these colored hyphae more abundant in the sterile portions of the fructification; they have bleached in sections preserved for several years in glycerine mounts. The stellate organs are more numerous than in any other of our species and prevent cutting satisfactorily thin sections of the hymenium by free hand. Some hyaline, even spores $4-4\frac{1}{2} \times 3 \mu$ were found floating in each preparation but not abundantly and are probably the spores of this species.

Specimens examined:

New Hampshire: Crystal Cascade, White Mts., *W. G. Farlow*, 1, type (in Mo. Bot. Gard. Herb., 55578).

(*To be continued*)

EXPLANATION OF PLATE

PLATE 1

Fig. 1. *Cladoderris dendritica*. *a*, showing upper side, collected in Cuba by W. A. & E. L. Merrill, 136; *b*, showing ribbed hymenium, collected in Colombia by W. D. Denton.

Fig. 2. *C. floridana*. Part of type, showing warts of hymenium, collected in Florida.

Fig. 3. *Skepperia spathularia*. After Patouillard.

Fig. 4. *Hypolyssus Montagnei*. *a*, collected in Bolivia by A. M. Bang; *b*, collected in Honduras by P. Wilson.

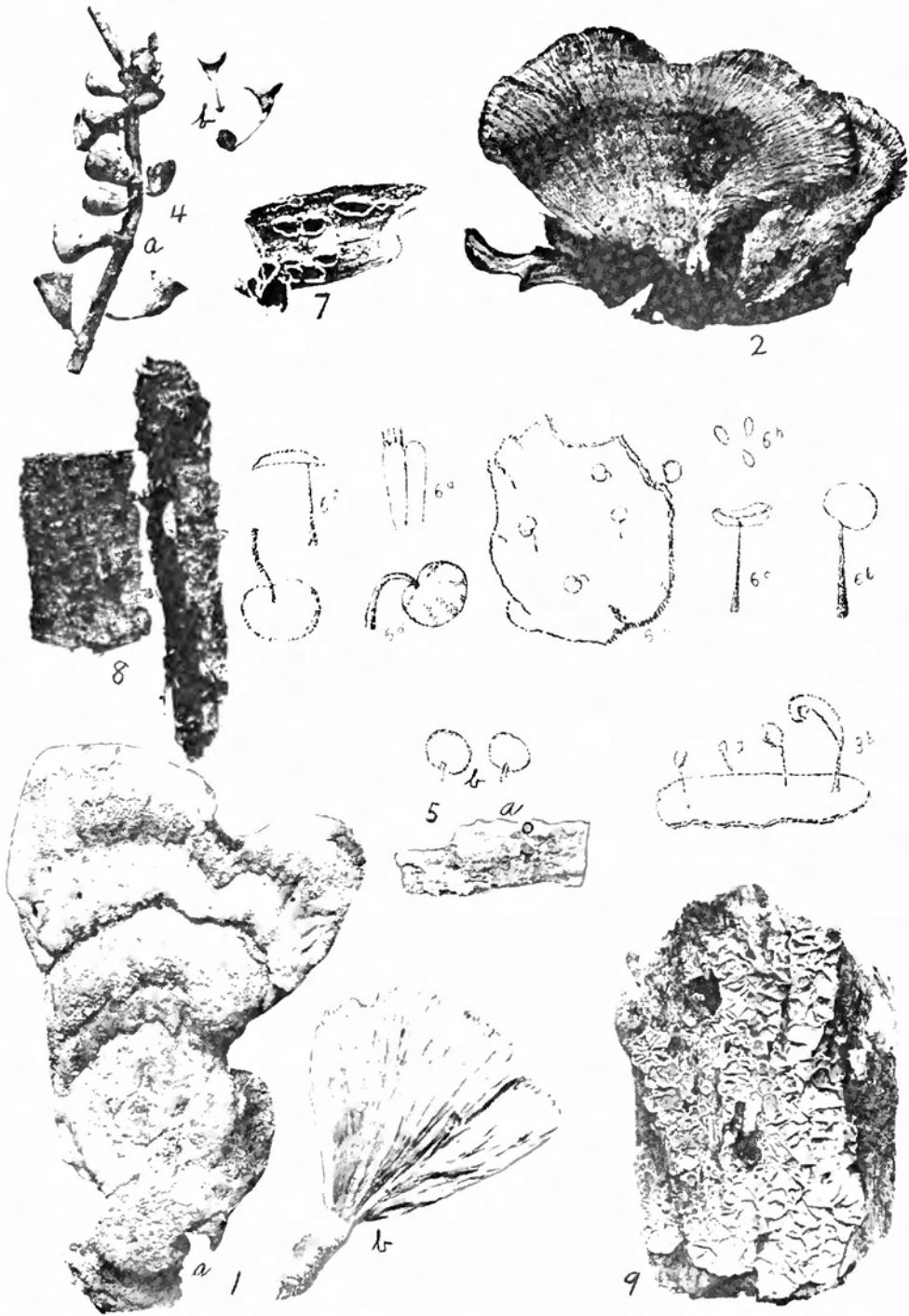
Fig. 5. *Cymatella pulverulenta*. *a*, piece of wood bearing several fructifications; *b*, 2 fructifications seen from under (hymenial) side, magnified, collected in Porto Rico by F. L. Stevens, 1358.

Fig. 6. *C. minima*. After Patouillard.

Fig. 7. *Cytidia flocculenta*. Collected in Montana by Mrs. L. A. Fitch.

Fig. 8. *C. salicina*. Showing both young, pezizoid and expanded fructifications, collected in Canada by J. Macoun.

Fig. 9. *C. tremellosa*. Collected in Louisiana by A. B. Langlois, 2620.



BURT—THELEPHORACEAE OF NORTH AMERICA

1. CLADODERRIS DENDRITICA.—2. C. FLORIDANA.—3. SKEPPERIA SPATHULARIA.
 —4. HYPOLYSSUS MONTAGNEL.—5. CYMATELLA PULVERULENTA.—6. C. MINIMA.
 —7. CYTIDIA FLOCCULENTA.—8. C. SALICINA.—9. C. TREMELLOSA.